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NOTES

AN EXAMINATION OF THE WAGE STUDIES OF THE NATIONAL INDUSTRIAL CONFERENCE BOARD

By PAUL H. DOUGLAS, *University of Chicago*

Wartime Changes in Wages. September 1914—March 1919. National Industrial Conference Board, Research Report No. 20, 128 pp.

Changes in Wages During and Since the War. September 1914—March 1920. National Industrial Conference Board, Research Report No. 31, 53 pp.

I

In these two studies the National Industrial Conference Board has attempted to survey the movement of money wages since September, 1914, in a number of industries. The first report covered the following manufacturing industries: metal, cotton, woolen, silk, boots and shoes, paper, rubber, and chemicals; the second added furniture, hosiery and knit goods, printing and publishing, and leather tanning.

The earlier study concerned itself with only two methods of computing wages: (1) actual weekly earnings, *i. e.*, the amounts actually received in the pay envelopes; (2) the hourly earnings, *i. e.*, the actual weekly earnings divided by the number of hours actually worked. Hourly earnings should be clearly distinguished from hourly wage rates in that they include their portion of any bonuses that may have been paid the worker. To illustrate: An employee with an hourly rate of fifty cents works sixty hours a week and receives not only sixty hours' pay but a bonus of ten hours' pay in addition for overtime. His weekly earnings are therefore \$35.00 and his average hourly earnings one-sixtieth of this, or 58.3 cents, whereas his wage rate is only 50 cents an hour. The Board states that the investigations of the National Metal Trades Association showed that "averages of hourly earnings . . . generally exceeded the corresponding averages of hourly rates by from two to five cents."* The later investigation introduced a further method, namely, that of full-time weekly earnings, *i. e.*, the hourly earnings multiplied by the number of hours considered as the standard week's work. Thus, a plant operating under the forty-eight

* Research Report No. 31, p. 1.

hour week would multiply the average hourly earnings by that figure. It is clear that this third basis is not one of actual earnings, since it makes no allowance for unemployment, underemployment, or overtime. It would naturally exceed the actual weekly earnings in those cases in which the number of hours worked was less than the standard, and would fall below them when overtime was worked. It was indeed this third basis upon which the Board leaned the most heavily in the second report, although data on this point were missing for the paper and chemical industries.

The second report broadened the scope of investigation in still another way; it included additional plants and consequently more employees. Thus, the second investigation covers for September, 1918, approximately 13,000 more employees in the metal industry than did the first, 4,000 more in the cotton industry, 20,000 more in woolens, and certain increases in other occupations as well.

One difficulty with the studies is their lack of a general summary. The first eschewed even finding a percentage increase for any industry as a whole, and contented itself with merely showing the increase by sexes and by occupations within each industry. The second emphasizes the comparison by sexes, but shows the increase for each of the crafts studied for the single date of March, 1920, as compared with September, 1914, and then only for hourly earnings and full-time weekly earnings—not for actual weekly earnings. Following the partial example of the report, the reviewer has employed a similar method and has weighted the indices given for the sexes in each industry by the number of each sex.* By this method he has secured the following indices for all three bases of wage computation both for March, 1920, and for September, 1918. From these indices, index numbers for the combined twelve industries have been computed. One is the simple arithmetic average of the indices for the separate industries, while the other is obtained by weighting the indices for each industry by the number of employees included in the wage study for that industry. It is not at all certain that the second method is under the circumstances more accurate than the first, since the relative numbers examined by the Board in the various industries does not necessarily correspond to the relative actual number employed in the country as a whole. Thus, the study made by the Board of the rubber industry in March, 1920, applied to 63,000 workers, while that for printing and publishing covered only 1,400. The weighted index, therefore, gives rubber forty-five times the importance attached to printing and publishing. Both

* The data for the chemical and furniture industries applied only to men. Hence weighting was not necessary here.

the weighted and unweighted index numbers, however, are given for use.

TABLE I
RELATIVE WAGES—ALL WORKERS
(September 1914 = 100)

Industry	Hourly earnings		Actual weekly earnings		Full-time weekly earnings	
	September, 1918	March, 1920	September, 1918	March, 1920	September, 1918	March, 1920
Metal manufacturing	179	210	196	213	170	191
Cotton manufacturing	205	272	206	251	206	236
Woolen manufacturing	204	272	203	252	203	240
Silk manufacturing	188	282	191	259	189	263
Boots and shoes	160	205	157	187	145	182
Paper manufacturing	179	213	179	220	177	243
Rubber manufacturing	197	267	179	238	197	243
Chemical manufacturing	175	261	193	273	175	244
Furniture manufacturing	158	217	161	212	158	194
Hosiery and knit goods	191	274	229	259	203	250
Leather tanning	195	270	212	274	191	236
Printing and publishing	138	196	130	186	129	185
Unweighted average	181	245	186	235	179	222
Weighted average	186	250	193	234	182	226

In order to translate these indicated increases of money wages into relative real wages, it is of course necessary to compare them with the increase in the cost of living during these periods. The three sources from which we can derive cost of living figures for approximately this period are: (1) the studies of the National Industrial Conference Board itself; (2) an average of the cost of living indices obtained by the United States Bureau of Labor Statistics for eighteen cities; and (3) the cost of living index for Massachusetts computed by the Special Commission on the Necessaries of Life of that state. This comparison is shown in the following table:

INCREASE IN THE COST OF LIVING* 1914–MARCH, 1920

	Bureau of Labor Statistics Eighteen cities December, 1914 = 100	National Industrial Conference Board July, 1914 = 100	Massachusetts Commission September, 1914 = 100
September, 1918	164.6	158.6	158.0
March, 1920	205.0	194.8	187.4

* The average increase in the cost of living for the eighteen cities is given for December, 1917, December, 1918, December, 1919, and June, 1920. The figures for September, 1918, and March, 1920, were secured on the assumption that the increase was evenly distributed through the months between the dates for which the figures were at hand. The same method was used with the statistics of the National Industrial Conference Board to secure the figure for September, 1918.

It will be seen that the figures of the Massachusetts Commission and the National Industrial Conference Board are from six to eighteen points below those of the Bureau of Labor Statistics. In all probability, however, the data of the Bureau of Labor Statistics are more reliable for the larger cities than are those of the other two. The situation in Massachusetts was undoubtedly not typical of the country as a whole, for that state had an oversupply of houses at the outbreak of the war and rents in consequence rose much more slowly there than in other parts of the country. And it is doubtful whether the investigations of the National Industrial Conference Board were made as carefully or as accurately as those of the Bureau.

We may now compare the various indices of money wages as computed by the National Industrial Conference Board with the indices of the cost of living, and secure the consequent indices of real wages.

TABLE II

PURCHASING POWER OF WAGES BASED ON WAGE STATISTICS OF NATIONAL INDUSTRIAL CONFERENCE BOARD

(September, 1914 = 100)

Basis of wage computation	September, 1918			March, 1920		
	Bureau of Labor Statistics index	Massachusetts Commission index	National Industrial Conference Board index	Bureau of Labor Statistics index	Massachusetts Commission index	National Industrial Conference Board index
HOURLY EARNINGS						
Simple average.....	110	114	114	120	126	131
Weighted average.....	113	117	117	122	128	133
ACTUAL WEEKLY EARNINGS						
Simple average.....	113	117	117	115	121	125
Weighted average.....	118	122	122	114	120	125
FULL-TIME WEEKLY EARNINGS						
Simple average.....	109	113	113	108	114	118
Weighted average.....	111	115	115	110	116	120

This apparently shows an increase in real wages of approximately 10 per cent during the war, by whatever method of computation is used. This result is so greatly at variance with other studies of wages in wartime,* which showed on the whole a decline in real wages, that it should be given the closest scrutiny before being accepted.

II

Fortunately, the investigations of the National Industrial Conference Board can be checked up with those of the United States Bureau of

* See the article by Frances Lamberson and myself, "The Movement of Real Wages, 1890-1918," in the *American Economic Review*, September, 1921.

Labor Statistics from 1914 to 1918 with regard to hourly earnings and full-time weekly earnings in three of the industries; namely, boots and shoes, woolen and worsted manufacturing, and cotton manufacturing. Bulletins 260, 261, and 262 respectively of the Bureau of Labor Statistics contain the data for the industries. These data were derived from actual payrolls, as was also that of the National Industrial Conference Board, and the definition given by each to "hourly earnings" and "full-time weekly earnings" is the same. The bulletins of the Bureau of Labor Statistics do not give a wage index for each industry as a whole, but they do give indices for practically all of the various occupations within the industry. The reviewer has, therefore, (1) taken the wage index for each *occupation* wherever given, and has shifted the base upon which the 1918 wage is computed to 1914; (2) computed an index for 1918 on a 1914 base from the actual money wages shown in the bulletins for those occupations for which an index was not given; (3) weighted the index for each occupation by the number employed.* By this method the relative increase in wages has been secured for each industry from 1914 to 1918 for hourly earnings and for full-time weekly earnings, the results of which are shown in Table III in comparison with those of the National Industrial Conference Board.

TABLE III

COMPARISON OF WAGE INCREASES IN 1918 OVER 1914 AS SHOWN BY THE INVESTIGATIONS OF THE NATIONAL INDUSTRIAL CONFERENCE BOARD AND THE UNITED STATES BUREAU OF LABOR STATISTICS

Industry	Hourly earnings			Full-time weekly earnings		
	Increase as per National Industrial Conference Board	Increase as per United States Bureau of Labor Statistics	Relation of National Industrial Conference Board to Bureau of Labor Statistics	Increase as per National Industrial Conference Board	Increase as per United States Bureau of Labor Statistics	Relation of National Industrial Conference Board to Bureau of Labor Statistics
Boots and shoes.....	60	39.6	+20.4	45	33.3	+11.7
Woolen and worsted manufacturing.....	104	86.7	+17.3	103	85.1	+17.9
Cotton manufacturing.....	105	75.5	+29.5	106	72.6	+33.4

A comparison of the statistics for these three industries, therefore, shows that the National Industrial Conference Board's figures for increases in hourly earnings are from 17.3 per cent to 29.5 per cent in

* The National Industrial Conference Board also weighted each occupation by the number employed in order to get a figure for each industry as a whole.

excess of those of the Bureau of Labor Statistics, and for full-time weekly earnings, from 11.7 per cent to 33.4 per cent higher.

Before attempting to determine the possible reasons for this difference, let us analyze the nature of the disparity somewhat more closely. In doing this the writer has compared the money wages for 1914 and 1918 for the various occupations within each industry as given by the National Industrial Conference Board, with the money wages listed for that occupation by the Bureau of Labor Statistics. Considerable difficulty has been experienced in doing this because of the different nomenclature used by the two organizations; but this has been largely overcome, and a comparison of many occupations has been accomplished. The detailed analysis that was made is too cumbersome for inclusion in this review, but the results shown may be briefly summarized:

(1) In the boot and shoe industry, the hourly earnings in 1914 as listed by the National Industrial Conference Board were, with only three exceptions,* from two to six cents below those given by the Bureau of Labor Statistics, and averaged a full 12 per cent less. The full-time weekly earnings in 1914 as shown by the Board were (with one exception) from \$1.35 to \$4.70 less than those given by the Bureau, and ranged from 10 to 25 per cent less. By 1918, however, the hourly earnings, according to the Conference Board, were (with two exceptions) from one to six cents *above* those of the Bureau, and averaged approximately 6 per cent more. Full-time weekly earnings as shown by the Conference Board also in general exceeded those of the Bureau.

(2) In the cotton manufacturing industry, the 1914 hourly earnings shown by the Conference Board (with two exceptions) exceeded those shown by the Bureau by from one to three cents, and by approximately 8 per cent. By 1918, however, the excess for the occupations compared ranged from three to twelve cents, with an average of about 28 per cent. The Board's 1914 figures for full-time weekly earnings were on the whole no higher than those of the Bureau; but by 1918 they ranged (with two exceptions) from two to five dollars more, or something over 20 per cent higher.

(3) In the woolen industry, the hourly earnings in 1914 as given by the Board were in general somewhat lower than those of the Bureau; but by 1918 they were, save for sorting, spinning, and female weavers, higher. Sorting and spinning earnings, however, were still much lower than in the corresponding scale of the Bureau. The full-time weekly earnings shown by the Conference Board were slightly lower than those

* One of these was more than the Bureau of Labor Statistics' figure, while two were less but not as much less as two cents an hour.

of the Bureau in 1914, but by 1918 they were (with two exceptions) from \$2 to \$13 more, with a general average of approximately 12 per cent higher.

How, then, may these discrepancies between the investigations of the National Industrial Conference Board and those of the Bureau of Labor Statistics be accounted for, and which is the more reliable?

(1) The periods covered by the two studies are slightly different; the comparisons of the Conference Board are made between the months of September, 1914, and September, 1918, while those of the Bureau are between the average for the whole year 1914 and the average for the year 1918. It is probable that owing to the depression caused by the outbreak of the Great War in August, 1914, earnings in September of that year were slightly lower than their average for the year as a whole. Furthermore, it is probably also true that in the year 1918, characterized as it was by fast-mounting money wages, the earnings for September were somewhat higher than the average of the year taken as a whole. This might partially explain the greater increase shown by the Conference Board.

(2) The samples taken by the Conference Board were considerably smaller than those taken by the Bureau. Thus, in the cotton manufacturing industry the Board drew its statistics from the payrolls of 13,900 employees, while the Bureau's study covered 91,000 employees. In the boot and shoe industry the Board based its study upon 13,500 employees, and the Bureau upon 61,000. In woolen manufacturing the Board's figures for 1918 were based upon 37,000 employees, while those of the Bureau covered 51,000.

(3) The samples of the Conference Board were less widely distributed geographically than those of the Bureau. The Board's statistics for cotton manufacturing were drawn only from the six states of Maine, Massachusetts, Connecticut, Rhode Island, New York, and New Jersey. The Bureau included not only these states but New Hampshire and (most important of all) the Southern States as well. In the boot and shoe industry the Conference Board's figures are based on returns from eight states, while those of the Bureau are based on at least twelve.* In woolen manufacturing, however, the states included in the two investigations are identical.

(4) The plants investigated by the Conference Board were undoubtedly almost overwhelmingly non-union, while those of the Bureau included union as well as non-union plants. The membership of the Conference Board is predominantly composed of employers

* Three factories are listed merely as being located in "other states." There is a possibility therefore that fourteen states are included.

operating non-union shops, and it is from their members that practically all of their wage statistics are taken. Now it is undoubtedly true in general that wages in non-union plants in 1914 were lower than those in union plants. Moreover, it is also probable that during the war wages in the non-union plants rose more rapidly than those in the union shops because of the great competition for labor and the fact that there were no previously agreed upon wage-rates, as in union shops, to retard the upward movement of wages. It is probable, therefore, that these factors in turn will account in part for the discrepancy between the two sets of studies.

(5) The methods used to collect data by the two bodies were different. The National Industrial Conference Board sent out requests for payrolls, and the plants that complied mailed them to the Board. The Bureau of Labor Statistics, on the other hand, sent out agents who personally secured the payrolls from the establishments, and made their computations from this material. There can be no question that the latter method is scientifically superior to the former. In the first place, there is a much greater likelihood of securing more representative returns through personal contact than through a long-distance request. Concerns with a low wage scale are especially reluctant to report their rates of payment. Secondly, there is a much greater opportunity to straighten out any difficulties that may present themselves in the material, and thus to clear up any obscurities. Therefore, although the method of collecting material followed by the Conference Board in the matter of wages is not open to the criticisms that can justly be leveled at their hours and output series, it is distinctly inferior to the method employed by the Bureau of Labor.

From the foregoing factors can we not conclude, then, that the apparent rise in real wages up to 1918 as shown by the National Industrial Conference Board has not been established? The writer believes, upon the basis of a rather extended investigation which he has directed, that from 1914 to 1918 the purchasing power of hourly wage rates decreased appreciably. He is still in doubt as to whether the purchasing power of actual weekly earnings including overtime increased or decreased during that time. During 1919 and the early part of 1920, however, he is inclined to agree that wages and wage rates perhaps rose faster than the cost of living.*

III

Finally, turning from the question of relative wages, if we accept the wage statistics of the Conference Board at their face value, we can

* See the article by Miss Lamberson and myself that has previously been referred to.

secure interesting sidelights upon the question of the adequacy of the wages paid in terms of the various accepted standards of living.

TABLE IV
AVERAGE EARNINGS OF MALE EMPLOYEES IN TWELVE INDUSTRIES AS REPORTED BY THE NATIONAL INDUSTRIAL CONFERENCE BOARD

Industry	September, 1918		March, 1920	
	Average actual weekly earnings (a)	Average yearly earnings (a $\times 52$)	Average actual weekly earnings (c)	Average yearly earnings (c $\times 52$)
Boots and shoes.....	\$23.62	\$1,228	\$28.70	\$1,492
Chemical manufacturing.....	25.24	1,312	35.72	1,857
Cotton manufacturing.....	20.50	1,066	24.87	1,293
Furniture manufacturing.....	17.39	904	22.87	1,189
Hosiery and knit goods.....	22.50	1,170	27.65	1,438
Leather.....	23.36	1,215	30.18	1,569
Metal manufacturing.....	27.73	1,442	29.79	1,549
Paper manufacturing.....	23.20	1,206	28.82	1,499
Printing and publishing.....	23.69	1,232	31.67	1,647
Rubber manufacturing.....	27.93	1,452	36.32	1,889
Silk manufacturing.....	21.48	1,117	28.98	1,507
Wool manufacturing.....	22.93	1,192	28.70	1,492

Table IV shows the average actual weekly earnings in September, 1918, and March, 1920, for males, and what the average yearly wage would have been at this rate had fifty-two weeks been worked.

When these wage statistics are compared with the amounts necessary to maintain a family of five at these times, still further proof is furnished of the inadequacy of the average adult male's wage to support family life. The most conservative and the most carefully worked out budget for the fall of 1918 is that of the Philadelphia Bureau of Municipal Research* which fixed \$1,637 as the amount necessary to support a family of five on "a minimum standard of health and comfort." It should be noted that this standard is in reality much lower than the "standard of health and decency" which has been followed by the United States Bureau of Labor Statistics.† The Philadelphia budget is indeed probably only slightly above a minimum of subsistence. This Philadelphia quantity budget was revised in November, 1919, and in August, 1920, being increased to \$1,803 in the former month and \$1,988 in the latter.‡ If we assume that the increase was evenly distributed throughout these nine months, we would have a figure of \$1,885 as the necessary amount in March, 1920. If we compare the average yearly wages for the various industries as given in Table IV (on the basis of fifty-two weeks' work) with this budget, we see very

* W. C. Beyer and others, *Workingman's Standard of Living in Philadelphia*.

† See the budgets collected by the Bureau of Applied Economics: *Standards of Living*. 1920 edition.

‡ *Citizens Business*, published by Philadelphia Bureau of Municipal Research, No. 463, p. 4.

clearly the inadequacy of the average wages of males, even during the periods of greatest business activity, adequately to support a family.

TABLE V

A COMPARISON OF AVERAGE FULL-TIME YEARLY EARNINGS WITH THE AMOUNT NECESSARY TO MAINTAIN THE PHILADELPHIA STANDARD

Industry	September, 1918		March, 1920	
	Amount needed to bring full- time yearly earnings to minimum	Per cent in- crease needed to bring full- time yearly earnings to minimum	Amount needed to bring full- time yearly earnings to minimum	Per cent in- crease needed to bring full- time yearly earnings to minimum
Boots and shoes	\$409	33	\$393	26
Chemical manufacturing	325	26	28	2
Cotton manufacturing	571	54	592	46
Furniture manufacturing	733	81	696	59
Hosiery and knit goods	467	40	447	31
Leather	422	35	316	20
Metal manufacturing	195	14	336	22
Paper manufacturing	431	36	386	26
Printing and publishing	405	33	238	14
Rubber manufacturing	185	13	4*	.
Silk manufacturing	520	47	378	25
Wool manufacturing	445	37	393	26

* Indicates excess.

Table V shows that in the fall of 1918, the average wage in every one of these industries was much less than the amount required to support a family. This deficiency, save for metal and rubber manufacturing, ranged from three hundred to over seven hundred dollars. An increase of from 23 to 81 per cent was needed to bring the average earnings in ten of the twelve industries up to the minimum. By 1920 the situation was somewhat improved, but even then in only one industry would the full-time yearly earnings have been sufficient for family support. In nine of the twelve industries the gap between the yearly rate of earnings and the minimum was over three hundred dollars, and in one it was nearly seven hundred dollars. In these nine industries increases ranging from 22 to 59 per cent were needed to bring the average yearly rate up to the minimum.

Now three objections may be urged against drawing the conclusion from the above that wages are inadequate: (1) That the standard of living chosen applied only to Philadelphia and cannot be used as a standard for the rest of the country. It is of course true that the cost of living does vary from locality to locality, but it is also undoubtedly true that these differences, at least in industrial centers, are not so great as are commonly supposed. Moreover, we have no information that would lead us to infer that the cost of living in Philadelphia is less

than in other manufacturing centers. (2) That the earnings of the male should not necessarily cover the cost of living for the family as a whole, since it is only proper to expect the family to receive income from other sources. This is a proposition to which one may give a qualified assent subject to judgment as to the specific source of income. Thus, while the work of the wife outside the home is sometimes proper when there are no children, it should be indulged in only in the rarest circumstances when there are children. The contributions of children over sixteen or indeed over fourteen may also be proper. Income from boarders is a source upon which a general conclusion is impossible since although it may be proper in some instances, in many others it is not. In general, however, we should beware of making total family income the test of the adequacy of the wage. The attempts of the family to secure supplementary income may indeed seriously impair the family life and vitality. (3) That since many men have either no dependents or less than four we should not use the family of five as the standard by which to measure the adequacy of men's wages, but should instead use a smaller family. A great deal of research is needed to determine how well-grounded such a contention is. At the present time we lack adequate information as to the proportion of adult males in the United States who have such a standard family, as well as the proportion that have more and those that have fewer dependents. Pending such fuller research and information, it does not seem wise to discard for the present at least the currently accepted standard in favor of a smaller family, particularly in view of the fact that even the present standard does not include (a) the initial cost of family furniture and fittings; (b) the expenses connected with the birth of children; (c) an adequate protection against the risks to which the worker is subjected; and (d) a proper provision for a human depreciation fund to protect the worker against industrial old age.

Although the above points might lead one to suppose that the indicated inadequacy of the wage is an overstatement, the following factors operate in the opposite direction: (1) The standard of living chosen was a most conservative one and one which many experts would increase. (2) The estimated yearly earnings were based upon working the full fifty-two weeks during the year at the same rate as during the period studied. This makes no allowance for unemployment save for such broken time as occurred during the period under consideration. When we remember that the amount of unemployment over a period of years is probably at least 10 per cent, this consideration assumes great importance. (3) The periods chosen were characterized by a great deal of overtime which would be non-existent at other points in the business

cycle when many even of those regularly employed would work only part-time. (4) Finally, it should be remembered that the above figures were only averages. There was, therefore, a very large body of workers who received less than the amounts indicated.

Although it is manifestly impossible to balance these unknown quantities with any degree of even approximate accuracy, it does seem most probable from the figures of the National Industrial Conference Board itself that during the most outwardly prosperous period in our recent economic history a very large section of our working population did not receive a wage high enough to maintain a "decent" standard of living.

A CRITIQUE OF COST-OF-LIVING STUDIES

BY GEORGE E. BARNETT, *Johns Hopkins University*

The rapid changes in retail prices in recent years have since 1917 made the cost of living the dominant consideration in wage adjustments. The importance of statistical measures of these changes has correspondingly increased. In this country the first continuous index numbers of the total cost of living were inaugurated by the Bureau of Labor Statistics in 1917. They showed changes in the total cost of living separately for each of a group of fourteen cities in which shipbuilding was being carried on. At a later date similar index numbers were made for a number of other large cities. The material used in making the separate city indices was still later combined into an index number for the country as a whole.

Reports of its studies of the cost of living were first published by the Industrial Conference Board in August, 1918.* The Board does not calculate index numbers for separate cities, but only an index number of the cost of living in the United States as a whole. Since the index numbers for the United States issued by the Bureau of Labor Statistics and the Industrial Conference Board give figures for exactly the same thing, and since the question as to which gives the more nearly correct result is important, it seems desirable, in place of a mere technical description of the Board's index number, to compare the two index numbers as to result and method.

The difficulty in making such a comparison is that the dates for which the two index numbers are calculated are not identical. The

* *War Time Changes in the Cost of Living*, Research Reports Nos. 9, 14, 17, National Industrial Conference Board.

Changes in the Cost of Living, Research Reports Nos. 19, 25, 28, 30, 33, 36, National Industrial Conference Board.

Comparisons are made with certain studies of the United States Bureau of Labor Statistics.